

JOURNAL OF CELLULAR PHYSIOLOGY

VITTORIO DEFENDI, *Managing Editor*
The Wistar Institute

EDITORS

P. I. MARCUS
University of Connecticut

E. A. MCCULLOCH
University of Toronto

R. P. PERRY
Institute for Cancer Research

P. SIEKEVITZ
The Rockefeller University

ASSOCIATE EDITORS

W. R. AMBERSON
Marine Biological Laboratories

R. S. KROOTH
Columbia University

R. B. ROBERTS
Carnegie Institution of Washington

D. W. BRONK
The Rockefeller University

I. LIEBERMAN
University of Pittsburgh

A. B. STAVITSKY
Western Reserve University

J. S. COLTER
University of Alberta

T. MAKINODAN
Oak Ridge National Laboratory

H. SWIFT
University of Chicago

B. EPHRUSSI
C.N.R.S. Gif-sur-Yvette, France

L. A. MANSON
The Wistar Institute

H. M. TEMIN
University of Wisconsin

L. GOLDSTEIN
University of Colorado

D. MARSLAND
Marine Biological Laboratories

G. TOMKINS
University of California

H. GREEN
Massachusetts Institute of Technology

D. MAZIA
University of California

L. WARREN
University of Pennsylvania

P. M. KRAEMER
University of California

M. L. MENDELSON
Lawrence Livermore Laboratory

L. WEISS
Roswell Park Memorial Institute

J. R. WHITTAKER
The Wistar Institute

VOLUME 80

AUGUST, OCTOBER, DECEMBER 1972

PUBLISHED BY

THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY
PHILADELPHIA, PA.

COPYRIGHT © 1972 BY
THE WISTAR INSTITUTE PRESS

All rights reserved

Contents

No. 1 AUGUST 1972

W. P. VAUGHAN AND D. D. McGREGOR. Lymphopoiesis in the Rat. I. The Effect of Pool Size on Lymphocyte Production	1
W. P. VAUGHAN AND D. D. McGREGOR. Lymphopoiesis in the Rat. II. The Effect of Thymectomy	13
HOWARD M. ROSENBERG, BRENDA BUCKHOLD SHANK AND EARLE C. GREGG. Volume Changes of Mammalian Cells Subjected to Hypotonic Solutions <i>In Vitro</i> : Evidence for the Requirement of a Sodium Pump for the Shrinking Phase	23
STEPHEN WOOD AND LEONARD PINSKY. Lesch-Nyhan Mutation: The Influence of Population Density on Purine Phosphoribosyltransferase Activities and Exogenous Purine Utilization in Monolayer Cultures of Skin Fibroblasts	33
FA-TEN KAO AND THEODORE T. PUCK. Genetics of Somatic Mammalian Cells. XIV: Genetic Analysis <i>In Vitro</i> of Auxotrophic Mutants	41
H. BECKER AND C. P. STANNERS. Control of Macromolecular Synthesis in Proliferating and Resting Syrian Hamster Cells in Monolayer Culture. III. Electrophoretic Patterns of Newly Synthesized Proteins in Synchronized Proliferating Cells and Resting Cells	51
FRANCISCO BERTINI, DANIEL R. BARI AND HECTOR MAZZEI. Incorporation and Intraparticulate Hydrolysis of ^{131}I -Albumin by Liver and Kidney of an Amphibian (<i>Bufo arenarum</i>)	63
L. LACKO, B. WITTKÉ AND P. GECK. The pH Dependence of Exchange Transport of Glucose in Human Erythrocytes	73
RONALD FRASER, BENNETT HORTON, DANIEL DUPOURQUE AND AMOZ CHERNOFF. The Multiple Hemoglobins of the Chick Embryo	79
H. NAGASAWA AND W. C. DEWEY. Effects of Cold Treatment on Synchronous Chinese Hamster Cells Treated in Mitosis	89
ATSUSHI TSUBOI AND RENATO BASERGA. Synthesis of Nuclear Acidic Proteins in Density-inhibited Fibroblasts Stimulated to Proliferate	107
MORGAN HARRIS. Effect of X-irradiation of One Partner on Hybrid Frequency in Fusions between Chinese Hamster Cells	119
J. W. SHERIDAN AND D. METCALF. Studies on the Bone Marrow Colony Stimulating Factor (CSF): Relation of Tissue CSF to Serum CSF	129
JENN C. CHEN, JOSEPH B. WARSHAW AND D. RAO SANADI. Regulation of Mitochondrial Respiration in Senescence	141
CHARLES LEVINSON, THOMAS C. SMITH AND TERRY M. MIKITEN. Lanthanum-induced Alterations of Cellular Electrolytes in Ehrlich Ascites Tumor Cells: A New View	149
KJELL HANSSON MILD, THOMAS L. JAMES AND KENNETH T. GILLEN. Nuclear Magnetic Resonance Relaxation Time and Self-diffusion Coefficient Measurements of Water in Frog Ovarian Eggs (<i>Rana pipiens</i>)	155

No. 2 OCTOBER 1972

J. F. HARTMANN, C. A. BUCK, V. DEFENDI, M. C. GLICK AND L. WARREN. The Carbohydrate Content of Control and Virus-transformed Cells	159
ANDREW SIVAK. Induction of Cell Division: Role of Cell Membrane Sites	167
B. VIJAYA KUMAR AND P. M. BHARGAVA. Activation of a Ribonuclease on Dispersion of Rat Liver to a Single Cell Suspension and Incubation of the Cells at 37°	175
DONALD L. PERKINS AND THEODORE L. JAHN. Contraction of Protoplasm. IV. Cinematographic Analysis of Unfertilized Sea Urchin Eggs Stimulated with Continuous Direct Current	189
M. A. S. MOORE AND N. WILLIAMS. Physical Separation of Colony Stimulating Cells from <i>In Vitro</i> Colony Forming Cells in Hemopoietic Tissue	195
TOSHIHIDE SATO. Multiple Sensitivity of Single Taste Cells of the Frog Tongue to Four Basic Taste Stimuli	207
MARK HALLETT AND EMILIO CARBONE. Studies of Calcium Influx into Squid Giant Axons with Aequorin	219
MARK E. COSTLOW AND GEORGE MELNYKOVYCH. Effects of Prednisolone on the Distribution and Activity of Two Phosphoesterases in Membrane Preparations from HeLa Cells	227
MARTINE PAPIERNIK. Ontogeny of the Human Lymphoid System: Study of the Cytological Maturation and the Incorporation of Tritiated Thymidine and Uridine in the Foetal Thymus and Lymph Node and in the Infantile Thymus	235
TIMOTHY A. LYERLA AND RONALD R. NOVALES. The Effect of Cyclic AMP and Cytochalasin B on Tissue Cultured Melanophores of <i>Xenopus laevis</i>	243
B. J. SMITH AND N. M. WIGGLESWORTH. A Cell Line Which is Temperature-sensitive for Cytokinesis	253
ROSS S. BASCH, V. G. MALATHI AND ROBERT SILBER. Nucleoside Deaminase Activity during the Recovery of X-irradiated, Bone Marrow-protected Mice	261
GRETA SANDER AND ARTHUR B. PARDEE. Transport Changes in Synchronously Growing CHO and L Cells	267
ENRIQUE ROZENGURT AND ARTHUR B. PARDEE. Opposite Effects of Di-butyril Adenosine 3':5' Cyclic Monophosphate and Serum on Growth of Chinese Hamster Cells	273
JULIA C. FONTAINE AND FRANK J. SWARTZ. Fluctuations of Feulgen- and Diphenylamine-DNA in Peripheral Leukocytes	281
CAROL JONES, PAUL WUTHIER, FA-TEN KAO AND THEODORE T. PUCK. Genetics of Somatic Mammalian Cells. XV. Evidence for Linkage between Human Genes for Lactic Dehydrogenase B and Serine Hydroxymethylase	291
MARVIN L. MEISTRICH. Separation of Mouse Spermatogenic Cells by Velocity Sedimentation	299
Errata (Ellem, K. A. O., and Stefan Mironescu. J. Cell. Physiol., 79: 389-406)	313

No. 3 DECEMBER 1972

J. F. WHITFIELD, J. P. MACMANUS, D. J. FRANKS, B. M. BRACELAND AND D. J. GILLAN. Calcium-mediated Effects of Calcitonin on Cyclic AMP Formation and Lymphoblast Proliferation in Thymocyte Populations Exposed to Prostaglandin E	315
RICHARD B. WHITNEY AND ROBERT M. SUTHERLAND. Requirement for Calcium Ions in Lymphocyte Transformation Stimulated by Phytohemagglutinin	329
F. A. SALINAS, L. H. SMITH AND J. W. GOODMAN. Cell Size Distribution in the Thymus as a Function of Age	339
HOWARD G. SACHS AND TERENCE F. McDONALD. Membrane Potentials of BHK (Baby Hamster Kidney) Cell Line: Ionic and Metabolic Determinants	347
M. TERZI. On the Selection for the Modal Chromosome Number in Chinese Hamster Cells	359
ALFRED W. L. JAY AND PETER B. CANHAM. Sedimentation of Single Human Red Blood Cells. Differences between Normal and Glutaraldehyde Fixed Cells	367
W. J. VISEK, G. M. KLODNY AND P. R. GROSS. Ammonia Effects in Cultures of Normal and Transformed 3T3 Cells	373
MARSHALL A. LICHTMAN, ANTHONY H. JACKSON AND WILLIAM A. PECK with the technical assistance of ELIZABETH KEARNEY. Lymphocyte Monovalent Cation Metabolism: Cell Volume, Cation Content and Cation Transport	383
J. P. HAMMAN AND H. H. SELIGER. The Mechanical Triggering of Bioluminescence in Marine Dinoflagellates: Chemical Basis	397
DONALD METCALF. Formation in Agar of Fibroblast-like Colonies by Cells from the Mouse Pleural Cavity and Other Sources	409
M. YOSHIKAWA-FUKADA AND T. NOJIMA. Biochemical Characteristics of Normal and Virally Transformed Mouse Cell Lines	421
JOHN W. LOUGH, MARK L. ENTMAN, EDWARD H. BOSEN AND JAMES L. HANSEN. Calcium Accumulation by Isolated Sarcoplasmic Reticulum of Skeletal Muscle during Development in Tissue Culture	431
RAYMOND F. GASSER, LAWRENCE E. SCHEVING AND JOHN E. PAULY. Circadian Rhythms in the Mitotic Index of the Basal Epithelium and in the Uptake Rate of ^3H -thymidine by the Tongue of the Rat	437
J. J. BLUM. Effect of AMP and Related Compounds on Glycogen Content of <i>Tetrahymena</i>	443
ELIZABETH K. SELL AND R. S. KROOTH. Tabulation of Somatic Cell Hybrids Formed between Lines of Cultured Cells	453
Index to Volume 80	463

